

**Listing of Claims**

1. (Previously Presented) A method of operating a multistage modulating boiler system, the multi-stage modulating boiler system including two or more stages of modulating boilers, the multi-stage modulating boiler system adapted to provide heat to a circulating fluid heated by the multi-stage modulating boiler system and to maintain a first temperature setpoint, the method comprising:

- receiving an indication that a stage of the multi-stage modulating boiler system should be activated and whether the stage is currently a first stage of the multi-stage modulating boiler to be activated;
- receiving a normal firing rate for the stage, the normal firing rate is based on an error signal that is related to a deviation between the first temperature set point and a temperature of the circulating fluid in the multi-stage modulating boiler system;
- activating the stage at the normal firing rate if the stage is not the first stage of the multi-stage boiler to be activated;
- activating the stage at a first firing rate if the stage is the first stage of the multi-stage boiler to be activated, wherein the first firing rate is less than the normal firing rate;
- maintaining the first firing rate for a period of time unless a predefined condition that is related to a system temperature occurs during the period of time; and
- activating the stage at the normal firing rate after the period of time expires.

2. (Previously Presented) The method of claim 1 wherein the predefined condition includes when the temperature of the circulating fluid in the multi-stage modulating boiler system drops below a predetermined level.

3. (Previously Presented) The method of claim 1 wherein the predefined condition includes when a rate of change for a sensed temperature for the circulating fluid in the multi-stage modulating boiler system rises above a predetermined level.

4. (Previously Presented) The method of claim 1 wherein:

the multi-stage modulating boiler system includes a modulating boiler stage for heating the circulating fluid, the modulating boiler stage having a primary heat exchanger and a bypass temperature sensor for sensing a bypass temperature of the circulating fluid entering the primary heat exchanger; and

the predefined condition includes a likelihood of condensation within the primary heat exchanger of the modulating boiler stage.

5. (Original) The method of claim 4 wherein the likelihood of condensation is predicted based upon sensing of the bypass temperature.

6. (Previously Presented) The method of claim 4 wherein:  
the modulating boiler stage includes a secondary heat exchanger associated with the primary heat exchanger and an inlet temperature sensor for sensing an inlet temperature of the circulating fluid entering the secondary heat exchanger; and  
the likelihood of condensation is predicted based upon sensing of the inlet temperature.

7. (Previously Presented) The method of claim 1 wherein the first firing rate is set independent of the normal firing rate.

8-23. (Canceled)

24. (Previously Presented) A controller for a multi-stage modulating boiler system having one or more modulating boiler stages, the controller configured to perform the steps of:

receiving an indication that a stage of the multi-stage modulating boiler system should be activated and whether the stage is currently a first stage of the multi-stage modulating boiler to be activated;

receiving a normal firing rate for the stage, the normal firing rate is based, at least in part, on a heat load on the multi-stage modulating boiler system;

activating the stage at the normal firing rate if the stage is not the first stage of the multi-stage boiler to be activated;

activating the stage at a first firing rate if the stage is the first stage of the multi-stage modulating boiler to be activated, wherein the first firing rate is less than the normal firing rate;

maintaining the first firing rate for a period of time unless a predefined condition that is related to a system temperature occurs during the period of time; and

activating the stage at the normal firing rate after the period of time expires.

25. (Previously Presented) A controller as in claim 24 wherein:

the multi-stage modulating boiler system includes a boiler stage for heating a circulating fluid, the boiler stage having a primary heat exchanger and a bypass temperature sensor for sensing a bypass temperature of the circulating fluid entering the primary heat exchanger; and

the predefined condition includes a likelihood of condensation within the primary heat exchanger.

26. (Previously Presented) A controller as in claim 25 wherein:

the multi-stage modulating boiler system includes a secondary heat exchanger associated with the primary heat exchanger and an inlet temperature sensor for sensing an inlet temperature of the circulating fluid entering the secondary heat exchanger; and

the likelihood of condensation is predicted based upon sensing of the inlet temperature.

27. (Previously Presented) A method of controlling stages in a multi-stage modulating boiler system, the method comprising:

receiving an indication that a stage of the multi-stage modulating boiler system that is not active is to become active;

determining whether the stage is the first stage to become active;

if the stage is the first stage to become active, activating the stage at a first firing rate and maintaining the first firing rate for a period of time unless a predefined condition that is related to a measured system temperature occurs during the period of time; and

activating the stage at second firing rate if the stage is not the first stage to become active.

28. (Previously Presented) A controller for controlling a stage in a multi-stage modulating boiler system, the controller configured to perform the steps of:

receiving an indication that a stage of the multi-stage modulating boiler system that is not active is to become active;

determining whether the stage is the first stage to become active;

if the stage is the first stage to become active, activating the stage at a first firing rate and maintaining the first firing rate for a period of time unless a predefined condition that is related to a measured system temperature occurs during the period of time; and

activating the stage at second firing rate that is higher than the first firing rate if the stage is not the first stage to become active.

29. (Previously Presented) A method of controlling a multi-stage modulating boiler system, the multi-stage modulating boiler system adapted to meet a heat load, the method comprising:

determining whether to activate a stage of the multi-stage modulating boiler system when no stages are active; and, if so:

activating a stage; and

controlling the stage with a stable firing rate independent of heat load for a period of time unless one or more of a number of conditions is satisfied during the period of time, wherein one of the predefined conditions is related to a measured system temperature and another one of the conditions include whether the stage is no longer needed.

30. (Previously Presented) The method of claim 29 wherein the conditions also include whether it is determined that the stage cannot operate without potential damage at the stable firing rate.

31. (Previously Presented) A controller for controlling a multi-stage modulating boiler system, the controller configured to perform the steps of:

determining whether to activate a stage of the multi-stage modulating boiler system when no stages are currently active; and, if so:

activating a stage; and

controlling the stage with a stable firing rate independent of heat load for a period of time unless at least one of a number of conditions is satisfied during the period of time, wherein the conditions include:

whether the stage is no longer needed.

32. (Previously Presented) A system controller for a multi-stage modulating boiler system, the system controller having at least a first configuration and a second configuration, wherein:

the first configuration of the system controller enables the system controller to perform the steps of:

determining that a stage of the multi-stage modulating boiler system that is inactive should become active;

signaling the stage to become active; and

indicating to the stage whether or not it is the first stage to become active; and

the second configuration of the system controller enables the system controller to perform the steps of:

determining that a stage of the multi-stage modulating boiler system that is inactive should become active;

signaling the stage to become active;

determining whether the stage is the first stage to become active and, if so, providing a heat demand signal to the stage at a level selected to keep the first stage at a relatively low output level for a period of time unless one of a number of conditions is met during the period of time.

33. (Previously Presented) The system controller of claim 32 wherein the number of conditions include:

whether the stage is no longer needed.

34. (Previously Presented) A stage controller for controlling a stage of a multi-stage modulating boiler system, the stage controller communicating with a boiler system controller, the stage controller performing the steps of:

in response to the system controller signaling that the stage is to become active, activating the stage; and

in response to the system controller indicating that the stage is the first stage to become active, activating the stage at a first firing rate and maintaining the first firing rate for a period of time unless a predefined condition occurs during the period of time.

35. (Previously Presented) The stage controller of claim 34 wherein, for the stage controller, a predefined condition includes a determination that condensation in a heat exchanger of the stage may be likely.

36. (Previously Presented) A method of operating a multi-stage modulating boiler system, the multi-stage modulating boiler system adapted to provide heat to maintain a first setpoint for a fluid heated by the multi-stage modulating boiler system, the method comprising:

receiving a signal indicating that a stage of the multi-stage modulating boiler system should be activated;

activating the stage at a first firing rate; and

maintaining the first firing rate unless one or more predefined conditions occur, wherein one or more of the predefined conditions is related to a system temperature.

37. (Previously Presented) A method as in claim 36 wherein one of the predefined conditions relates to one or more sensed temperature(s) of the fluid.

38. (Previously Presented) A method as in claim 36 wherein one of the predefined condition relates to the expiration of a predetermined period of time.